 National Transportation Safety Board FACTUAL REPORT AVIATION		NTSB ID: CHI03FA057		Aircraft Registration Number: N9523P	
		Occurrence Date: 01/18/2003		Most Critical Injury: Fatal	
		Occurrence Type: Accident		Investigated By: NTSB	
Location/Time					
Nearest City/Place Hill City	State MN	Zip Code 55748	Local Time 0638	Time Zone CST	
Airport Proximity: Off Airport/Airstrip		Distance From Landing Facility:			
Aircraft Information Summary					
Aircraft Manufacturer Cirrus Design Corp.		Model/Series SR-22		Type of Aircraft Airplane	
Revenue Sightseeing Flight: No			Air Medical Transport Flight: No		
Narrative					
<p>Brief narrative statement of facts, conditions and circumstances pertinent to the accident/incident:</p> <p>HISTORY OF FLIGHT</p> <p>On January 18, 2003, at 0638 central standard time, a Cirrus SR-22, N9523P, owned and piloted by a private pilot, was destroyed following an in-flight collision with terrain near Hill City, Minnesota. The 14 CFR Part 91 personal flight was not on a flight plan. Visual meteorological conditions prevailed at the time of the accident. The pilot and single passenger sustained fatal injuries. The airplane departed the Grand Rapids/Itasca County Airport (GPZ), Grand Rapids, Minnesota, at 0630, with an intended destination of St. Cloud Regional Airport (STC), St. Cloud, Minnesota.</p> <p>An individual representing N9523P contacted the Princeton Automated Flight Service Station (AFSS) at 0455 on the morning of the accident. The individual requested a visual flight rules (VFR) weather briefing from GPZ to STC, departing at 0600. The caller was advised of the current and forecast conditions along the proposed route of flight, as well as of the Aeronautical Meteorological Information (AIRMET) in effect at the time.</p> <p>An individual representing N9523P requested an abbreviated weather briefing from Princeton AFSS at 0541. Proposed departure time was stated as 0600. During his initial statement to the briefer, the caller noted that conditions at GPZ were marginal at the time. He noted that current conditions at GPZ were about 2,800 feet overcast and that he was "hoping to slide underneath it and then climb out." He requested current conditions at STC and any pilot reports. He was advised of the STC conditions and that no pilot reports were on file across the state at that time.</p> <p>Several witnesses reported seeing and/or hearing the aircraft shortly before the accident. An individual who resided approximately 4-1/2 miles south of Grand Rapids reported seeing an aircraft flying southbound past his residence. He stated the aircraft appeared to be following the road. He estimated the aircraft's altitude as 100 feet above the trees, and its speed as 150 miles per hour. He noted the engine sound was smooth, it "wasn't laboring." He added: "That thing was moving." He recalled the weather conditions at his location as clear and moon lit.</p> <p>A second individual who resided at the north end of Hill Lake stated that he stepped outside and saw an airplane come over a hill northeast of his home. The aircraft's flight path appeared to be northeast-to-southwest, passing slightly east of his location. He remarked that he thought the aircraft was "too low" and the pilot "better pull that thing up." He recalled weather conditions at his location as partly to mostly cloudy, with a fair amount of moonlight.</p> <p>A third individual, located in Hill City at the time, reported seeing an aircraft similar to the accident aircraft fly over. He stated the airplane "seemed to be following the highway." He added, "If he'd been two blocks east, he'd have hit the water tower," estimating the aircraft's altitude as 100 feet agl. He noted the engine seemed to be at full throttle and that it "wasn't</p>					
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missing." "He was going fast," he added. He recalled weather conditions at his location as clear and cold.

A fourth individual, located about ½ mile south of the accident site, heard the aircraft fly over. He stated that it "sounded like the prop wasn't catching any air. It was just screaming." Approximately 3-4 seconds after the aircraft flew over, he stated that he heard what he considered to be the impact. He noted that as he was looking out his window, he saw a "fireball" up over the trees. He recalled the weather conditions at his location as clear, with a full moon.

Initial 9-1-1 calls were received by local authorities approximately 0640. The accident site was located at 0738 with the assistance of an emergency medical helicopter affiliated with a local hospital.

PERSONNEL INFORMATION

The pilot, age 47, held a private pilot certificate with an airplane single-engine land rating. He held a third class medical certificate issued on October 28, 2002, with a limitation of "Must wear corrective lenses."

The pilot's logbook was recovered at the scene. Some pages were damaged and partially unreadable. According to the logbook, he had logged 248.0 hours total time. Of these, 18.9 were in an SR-22. Except for 1.0 hour in a simulator, the remaining flights logged were in a Cessna 172 aircraft.

He had logged a total of 57.0 hours of instrument flight time and 19.0 hours of night flight time. Instrument and night flight time in the SR-22 totaled 0.3 and 2.3 hours, respectively.

According to Cirrus Design/University of North Dakota records, the pilot completed the SR-22 training course on December 12, 2002. The course consisted of 4 flights for a total of 12.5 hours of dual flight instruction and 5.3 hours of ground instruction.

The record indicates a ground lesson, which included "Brief on VFR into IMC procedures", was completed on the last day of the course. The flight lesson entitled "IFR Flight (Non-rated)" was not conducted.


A VFR-only completion certificate and High Performance aircraft endorsement were awarded on December 12th. The endorsement was limited to SR-22 aircraft only, according to the training record.

AIRCRAFT INFORMATION

The airplane involved in the accident was a 2002 Cirrus SR-22, S/N 0399. An airworthiness certificate was issued on November 26, 2002. The pilot took delivery of the aircraft on December 9, 2002. Total time on the airframe and engine at the time of the accident was 35.7 hours.

Maintenance logbook entries noted minor discrepancies were repaired after delivery. On December 5, 2002, an entry indicating removal, rebalancing and reinstallation of the left elevator was completed. According to Cirrus Design records, the item was related to the elevator tip being replaced due to some cosmetic defects noted on delivery. Cirrus Design procedures require rebalancing of the flight controls after repair or repainting.

Logbook entries also indicate an engine pre-heater was installed after delivery. This was completed on December 27, 2002, at 30.2 hours.

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METEOROLOGICAL INFORMATION

Routine aviation weather reports (METAR's) for airports in the area on the morning of the accident were as follows:

Location: Grand Rapids (GPZ) -- 20 nautical miles north of the accident site;
 Time: 0635;
 Wind: 320 degrees magnetic at 17 knots, gusting to 22 knots;
 Visibility: 7 statute miles;
 Sky condition: Few clouds at 300 feet agl, broken clouds at 1,400 feet agl, and overcast clouds at 2,700 feet agl;
 Temperature: -16 degrees Celsius;
 Dew point: -21 degrees Celsius;
 Altimeter: 29.85 inches of mercury.

Location: Aitkin Municipal (AIT) -- 21 nautical miles south of the accident site;
 Time: 0635;
 Wind: 310 degrees magnetic at 9 knots, gusting to 17 knots;
 Visibility: 10 statute miles;
 Sky condition: Scattered clouds at 2,500 feet agl;
 Temperature: -14 degrees Celsius;
 Dew point: -17 degrees Celsius;
 Altimeter: 29.88 inches of mercury.


Location: Brainerd Lakes Regional (BRD) -- 37 nautical miles south-southwest of the accident site;
 Time: 0636;
 Wind: 310 degrees magnetic at 10 knots, gusting to 16 knots;
 Visibility: 10 statute miles;
 Sky condition: Broken clouds at 2,300 feet agl;
 Temperature: -16 degrees Celsius;
 Dew point: -19 degrees Celsius;
 Altimeter: 29.91 inches of mercury.

AIRMETs for IFR conditions and turbulence were in effect at the time of the accident. AIRMET Sierra for occasional ceilings below 1,000 feet agl and/or visibilities below 3 statute miles in light snow showers and blowing snow was issued at 0245. IFR conditions along the GPZ-STC route of flight were expected to continue beyond 0900, ending around 1200.

AIRMET Tango for occasional moderate turbulence below 8,000 feet msl was issued at 0245, and was forecast to exist through 1500.

According to data obtained from the National Climactic Data Center, the winds aloft in the vicinity of Minneapolis (the closest reporting station to the accident site) at 0600 on January 18th were from 325 degrees magnetic at 31 knots, at an altitude of 914 meters (2,999 feet).

According to data published by the U.S. Naval Observatory, civil twilight in Grand Rapids, Minnesota, on the morning of the accident began at 0720. Sunrise was at 0754. A full moon occurred

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at 0448 that morning.

The Aeronautical Information Manual defines marginal VFR weather conditions as a ceiling of 1,000 to 3,000 feet and/or a visibility of 3 to 5 miles.

WRECKAGE AND IMPACT INFORMATION

The NTSB on-site investigation began on January 19, 2003, approximately 0900.

The location of the accident site was determined to be 46 degrees 53 minutes 28 seconds North latitude and 93 degrees 35 minutes 48 seconds West longitude by a global positioning system receiver.

The aircraft impacted into level wooded terrain. The site was located approximately 3/4 mile east of Minnesota Highway 169 and 1/4 mile south of 610th Street in Aitkin County. The surrounding area was sparsely populated and heavily wooded.

The entire debris path was approximately 500 feet long. It was oriented on a 280-degree magnetic heading.

Beginning at the initial tree strikes, the debris pattern observed was fan shaped. It measured a maximum width of approximately 40 feet over a distance of about 320 feet. The area continued to a distance of approximately 370 feet from the initial impact strikes and included the cabin area of the aircraft. The engine, with the hub and propeller attached, was found approximately 500 feet from the initial impact strikes, completely separated from the aircraft structure.

The angle formed by the tree strikes, from initial tree contact to terrain impact, was approximately 15 degrees (relative to the terrain).

The aircraft was fragmented. Wing and empennage structure was spread throughout the "fan shaped" area. The left and right wing tips were found 85 feet from the initial tree contact. The left tip was 22 feet left of the debris path centerline. The right tip was 8 feet right of the debris path centerline.

The rudder and vertical stabilizer spar, with hinges attached, was located along the debris path centerline. Vertical stabilizer skin surfaces were located near the rudder. The horizontal stabilizer was separated from the aircraft and was also found along the debris path centerline. The elevators were separated from the horizontal stabilizer.

The ailerons were separated from the wings. Although they were found in multiple pieces, each aileron was accounted for in its entirety at the accident site.

Hinges were separated from their respective control surfaces and mating spars. A section of spar remained attached to the hinge fittings, however, the spars themselves were fragmented. The hinges, although damaged, were still intact. Attachment hardware was secure. No pre-existing defects in the spars were observed.

The flap actuator was recovered. The jackscrew portion of the actuator was broken approximately 11.75 inches from the housing. According to Cirrus Design, the actuator extension observed corresponded to a flaps up (zero degree deflection) configuration.

The cabin area was damaged. It was located along the debris centerline, approximately 330 feet from the initial tree strikes. It was contained within a 10-foot diameter area.

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The engine was found sitting inverted, separated from the engine mount and cowling, and was located approximately 150 feet from the main cabin area. The propeller was still secured to the engine. The three-blade Hartzell propeller exhibited S-shaped bending and multiple leading edge gouges. Two of the blade tips were sheared from the remainder of the propeller. One blade was bent through approximately 100 degrees, beginning about 9 inches from the hub.

An engine examination was conducted. Engine continuity was verified through crankshaft rotation. Compression was present on all cylinders. Cylinder five exhibited less compression than the others.

The magnetos were damaged and produced a spark when the drive shaft was rotated. The spark plugs were removed. They were light gray in appearance and appeared to be gapped correctly.

The fuel manifold was removed and disassembled. The diaphragm was intact and fluid consistent in appearance and odor to aviation gasoline was present. A small amount of debris, including a partial pine needle, was present.

The fuel pump was separated from the engine and the drive coupling was missing. No fuel was present in the pump. The pump vanes were intact. The oil pump was free to rotate by hand.

The exhaust muffler was disassembled. The muffler was partially crushed, however it was not perforated.

The artificial horizon was disassembled. The gyro assembly was intact. Score marks were found on the gyro case.

Portions of the cabin area and several wing skin fragments, as well as localized ground cover and trees within the debris area, exhibited evidence of a post-impact fire.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was performed on the pilot by the Ramsey County Medical Examiner's Office, St. Paul, Minnesota, on January 19, 2003.

A Forensic Toxicology Fatal Accident Report concerning the pilot was prepared by the FAA Civil Aeromedical Institute, Oklahoma City, Oklahoma. The following findings were reported:

EPHEDRINE present in the Kidney and Liver;
 PHENYLPROPANOLAMINE detected in the Kidney and Liver;
 PSEUDOEPHEDRINE detected in the Kidney and Liver.

According to the report, no blood was available for testing.

Ephedrine is the active ingredient found in over-the-counter decongestants, allergy medications, asthma medications, and diet pills.

Pseudoephedrine is the active ingredient found in common over-the-counter decongestants, such as Sudafed.

Phenylpropanolamine is a metabolite of Ephedrine and Pseudoephedrine. It is an over-the-counter decongestant and appetite suppressant. Phenylpropanolamine is currently not commercially available in the United States.

RESEARCH AND TESTING

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Radar data was obtained from the Federal Aviation Administration (FAA) - Minneapolis Air Route Traffic Control Center (ARTCC). Review of the data indicated a single "1200" VFR transponder beacon code in the vicinity of GPZ about the time of the accident. The target's ground track was plotted using a commercially available computer program and is appended to this report.

The initial radar contact was at 0630:16 over GPZ at 1,700 feet pressure altitude. The aircraft associated with the beacon code proceeded southbound, paralleling Minnesota Highway 169, and reached a maximum of 3,200 feet pressure altitude.

At 0636:51, the target began a descending left turn, reaching a pressure altitude of 2,400 feet at 0637:27. This was an average descent rate of 1,166 feet-per-minute (fpm). From this location, the target entered a climb while the radius of the continuing left turn decreased.

Final radar contact was at 0637:39; 2,900 feet pressure altitude. This was an average climb rate of 2,500 fpm from a pressure altitude of 2,400 feet at 0637:27. The coordinates of this contact were 46 degrees 53 minutes 26 seconds North latitude and 93 degrees 35 minutes 30 seconds West longitude.


Final radar contact was 0.21 nautical miles from the accident site, as calculated by the plotting program. The magnetic course from the last radar location to the site was 278 degrees.


The aircraft's average ground speed, true airspeed and climb/descent rate were computed based on the raw radar data and measured winds aloft. The aircraft's true airspeed averaged 191 knots over the final one minute of radar data. The rate of climb averaged 2,500 fpm between the final two radar data points. This followed an average descent rate of 2,000 fpm, 36 seconds earlier, between 0636:51 and 0637:03. Plots of the aircraft's ground speed, true airspeed and climb/descent rates are appended to this report.


The SR-22 Pilot's Operating Handbook (POH) denotes airspeed limitations and performance capabilities for the aircraft. The handbook specifies a "Never Exceed Speed", VNE, of 204 knots calibrated airspeed. The "Maximum Structural Cruising Speed", VNO, is denoted as 180 knots calibrated airspeed. It also lists a rate of climb of 1,428 fpm at a sea level (zero foot) pressure altitude and -20 degrees Celsius air temperature.

ADDITIONAL INFORMATION

Parties to the investigation included the Federal Aviation Administration (FAA) - Minneapolis Flight Standards District Office (FSDO), Minneapolis, Minnesota; Cirrus Design, Duluth, Minnesota; Teledyne Continental Motors, Mobile, Alabama; and Ballistic Recovery Systems, South St. Paul, Minnesota.

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Landing Facility/Approach Information					
Airport Name N/A	Airport ID:	Airport Elevation Ft. MSL	Runway Used N/A	Runway Length	Runway Width
Runway Surface Type:					
Runway Surface Condition:					
Approach/Arrival Flown: NONE					
VFR Approach/Landing: None					
Aircraft Information					
Aircraft Manufacturer Cirrus Design Corp.		Model/Series SR-22		Serial Number 0399	
Airworthiness Certificate(s): Normal					
Landing Gear Type: Tricycle					
Amateur Built Acft? No	Number of Seats: 4	Certified Max Gross Wt. 3400 LBS		Number of Engines: 1	
Engine Type: Reciprocating	Engine Manufacturer: Continental		Model/Series: IO-550-N(7)	Rated Power: 310 HP	
- Aircraft Inspection Information					
Type of Last Inspection Annual	Date of Last Inspection 11/2002	Time Since Last Inspection 36 Hours		Airframe Total Time 36 Hours	
- Emergency Locator Transmitter (ELT) Information					
ELT Installed?/Type Yes /		ELT Operated?	ELT Aided in Locating Accident Site? No		
Owner/Operator Information					
Registered Aircraft Owner Gary R. Prokop		Street Address 35181 Pooles Bay Road			
		City Grand Rapids	State MN	Zip Code 55744	
Operator of Aircraft Gary R. Prokop		Street Address 35181 Pooles Bay Road			
		City Grand Rapids	State MN	Zip Code 55744	
Operator Does Business As:			Operator Designator Code:		
- Type of U.S. Certificate(s) Held: None					
Air Carrier Operating Certificate(s):					
Operating Certificate:			Operator Certificate:		
Regulation Flight Conducted Under: Part 91: General Aviation					
Type of Flight Operation Conducted: Personal					
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On File		On File		On File	On File	47																																																																																									
Sex: M	Seat Occupied: Left	Occupational Pilot? Business			Certificate Number: On File																																																																																										
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Airplane Rating(s): Single-engine Land																																																																																															
Rotorcraft/Glider/LTA: None																																																																																															
Instrument Rating(s): None																																																																																															
Instructor Rating(s): None																																																																																															
Current Biennial Flight Review? 07/2001																																																																																															
Medical Cert.: Class 3		Medical Cert. Status: Valid Medical--w/ waivers/lim.			Date of Last Medical Exam: 10/2002																																																																																										
<table border="1"> <thead> <tr> <th rowspan="2">- Flight Time Matrix</th> <th rowspan="2">All A/C</th> <th rowspan="2">This Make and Model</th> <th rowspan="2">Airplane Single Engine</th> <th rowspan="2">Airplane Multi-Engine</th> <th rowspan="2">Night</th> <th colspan="2">Instrument</th> <th rowspan="2">Rotorcraft</th> <th rowspan="2">Glider</th> <th rowspan="2">Lighter Than Air</th> </tr> <tr> <th>Actual</th> <th>Simulated</th> </tr> </thead> <tbody> <tr> <td>Total Time</td> <td>248</td> <td>19</td> <td>248</td> <td></td> <td>19</td> <td>2</td> <td>55</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Pilot In Command(PIC)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Instructor</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Instruction Received</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Last 90 Days</td> <td>53</td> <td>19</td> <td>53</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Last 30 Days</td> <td>16</td> <td>5</td> <td>16</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Last 24 Hours</td> <td>0</td> <td>0</td> <td>0</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>						- Flight Time Matrix	All A/C	This Make and Model	Airplane Single Engine	Airplane Multi-Engine	Night	Instrument		Rotorcraft	Glider	Lighter Than Air	Actual	Simulated	Total Time	248	19	248		19	2	55				Pilot In Command(PIC)											Instructor											Instruction Received											Last 90 Days	53	19	53								Last 30 Days	16	5	16								Last 24 Hours	0	0	0							
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Weather Information					
WOF ID	Observation Time	Time Zone	WOF Elevation	WOF Distance From Accident Site	Direction From Accident Site
GPZ	0635	CST	1355 Ft. MSL	20 NM	10 Deg. Mag.
Sky/Lowest Cloud Condition: Few			300 Ft. AGL	Condition of Light: Night	
Lowest Ceiling: Broken			1400 Ft. AGL	Visibility: 7 SM	Altimeter: 29.85 "Hg
Temperature: -16 °C		Dew Point: -21 °C	Weather Conditions at Accident Site: Visual Conditions		
Wind Direction: 320		Wind Speed: 17		Wind Gusts: 22	
Visibility (RVR): Ft.		Visibility (RVV) SM			
Precip and/or Obscuration:					

Accident Information					
Aircraft Damage: Destroyed		Aircraft Fire: None		Aircraft Explosion: None	

- Injury Summary Matrix	Fatal	Serious	Minor	None	TOTAL	
First Pilot	1				1	
Second Pilot						
Student Pilot						
Flight Instructor						
Check Pilot						
Flight Engineer						
Cabin Attendants						
Other Crew						
Passengers	1				1	
- TOTAL ABOARD -	2				2	
Other Ground						
- GRAND TOTAL -	2				2	

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Administrative Information		
<p>Investigator-In-Charge (IIC)</p> <p>Tim Sorensen</p>		
<p>Additional Persons Participating in This Accident/Incident Investigation:</p> <p>Wendy Johnson FAA - Minneapolis FSDO Minneapolis, MN</p> <p>Mike Busch Cirrus Design Duluth, MN</p> <p>John Kent Continental Motors Seagoville, TX</p> <p>Mark Thomas Ballistic Recovery Systems South St. Paul, MN</p>		
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